

REMARKS

Claims 1 and 3-35 were examined and reported in the Office Action. Claims 1, 3, 5, 7-9, 16-22 and 29-35 are rejected. Claims 3 and 7 are canceled. Claims 1 and 5 are amended. Claims 1, 5 and 8-35 remain.

Applicant requests reconsideration of the application in view of the following remarks.

I. 35 U.S.C. § 103

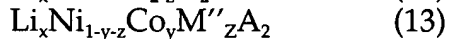
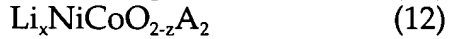
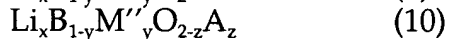
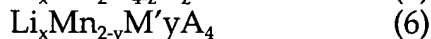
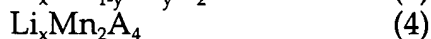
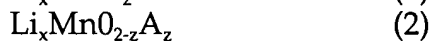
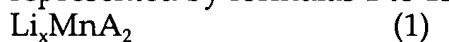
A. It is asserted in the Office Action that claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 and 37 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 5,869,208 issued to Miyasaka ("Miyasaka "), in view of U.S. Patent No. 5,641,591 issued to Kawakami et al. ("Kawakami "). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2142

"[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP §2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974))." "*All words in a claim must be considered in judging the patentability of that claim against the prior art.*" (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant's amended claim 1 contains the limitations of

a physical mixture of a positive active material comprising a lithiated transition metal compound, and an additive, said additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; a binder; a carbon conductive agent; and an organic solvent, wherein said positive active material composition is prepared by physically mixing said positive active material, said binder in said organic solvent in a form of slurry, wherein the additive is 0.01 to 10 wt% of the positive active material, wherein the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:



wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Applicant's amended claim 5 contains the limitations of

physically mixing a positive active material with an additive, the positive active material being selected from the group consisting of lithiated transition metals, and the additive at least one of Si, B, Ga, Ge, Ca, Mg, Sr and Ba; adding an organic solvent, a binder, and a carbon conductive agent to the mixture to prepare a positive active material slurry composition; coating the positive active material composition on a current collector; and drying the current collector coated with the positive active material slurry composition, wherein the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of the formulas 1 to 13:

- $$\begin{aligned} \text{Li}_x\text{MnA}_2 & (1) \\ \text{Li}_x\text{MnO}_{2-z}\text{A}_z & (2) \\ \text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2 & (3) \\ \text{Li}_x\text{Mn}_2\text{A}_4 & (4) \\ \text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z & (5) \\ \text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4 & (6) \\ \text{Li}_x\text{BA}_2 & (7) \\ \text{Li}_x\text{BO}_{2-z}\text{A}_z & (8) \\ \text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2 & (9) \\ \text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z & (10) \\ \text{Li}_x\text{NiCoA}_2 & (11) \\ \text{Li}_x\text{NiCoO}_{2-z}\text{A}_z & (12) \\ \text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2 & (13) \end{aligned}$$

where $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Miyasaka discloses a lithium ion secondary battery. Miyasaka further discloses that when carbon or graphite is used as an electroconductive material, the amount incorporated into the electrode material is 2 to 15 wt.%. Miyasaka, however, does not teach, disclose or suggest

the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:

- $$\begin{aligned} \text{Li}_x\text{MnA}_2 & (1) \\ \text{Li}_x\text{MnO}_{2-z}\text{A}_z & (2) \\ \text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2 & (3) \\ \text{Li}_x\text{Mn}_2\text{A}_4 & (4) \\ \text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z & (5) \\ \text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4 & (6) \\ \text{Li}_x\text{BA}_2 & (7) \\ \text{Li}_x\text{BO}_{2-z}\text{A}_z & (8) \\ \text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2 & (9) \\ \text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z & (10) \\ \text{Li}_x\text{NiCoA}_2 & (11) \\ \text{Li}_x\text{NiCoO}_{2-z}\text{A}_2 & (12) \\ \text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2 & (13) \end{aligned}$$

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one

transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Kawakami discloses a rechargeable battery using a lithium chemical reaction. Applicant's claimed invention asserts that Si, Al, Mg or Ge are used as additives. The effect caused when the used amount of additive is 0.01 to 10 wt% of the active material cannot be obtained or expected from Kawakami. In Applicant's claimed invention, if the amount of the additives is more than 10 wt%, the excess additives may act as impurities, which results in adverse effects. If the amount of the additives is less than 0.01 wt%, the effect of the additives is not induced. Additionally, in Applicant's claimed invention, the additives have good reactivity with HF, which attacks Mn present in a surface of a manganese-based active material. Thus, Mn is dissolved in the electrolyte, deteriorating the cycle life characteristics. Therefore, Applicant's claimed active material, by having the additives, exhibits good cycle life characteristics. This is not taught, disclosed or suggested by Kawakami.

Further, Kawakami does not teach, disclose or suggest

the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:

- Li_xMnA_2 (1)
- $\text{Li}_x\text{MnO}_{2-z}\text{A}_z$ (2)
- $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$ (3)
- $\text{Li}_x\text{Mn}_2\text{A}_4$ (4)
- $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$ (5)
- $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$ (6)
- Li_xBA_2 (7)
- $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ (8)
- $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2$ (9)
- $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z$ (10)
- $\text{Li}_x\text{NiCoA}_2$ (11)
- $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_2$ (12)
- $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2$ (13)

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group

consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Neither Miyasaka, Kawakami, nor the combination of the two, teach, disclose or suggest all the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Miyasaka, Kawakami, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Miyasaka in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 16, 17, 20 and 21, and 29, 30 and 33-34, respectively, would also not be obvious over Miyasaka in view of Kawakami for the same reason.

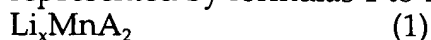
Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 and 37 are respectfully requested.

B. It is asserted in the Office Action that claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 and 37 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 5,851,696 issued to Saidi et al. ("Saidi"), in view of U. S. Patent No. 5,641,591 issued to Kawakami et al. ("Kawakami"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's claims 16, 17, 20 and 21 either directly or indirectly depend on amended claim 1. Applicant's claims 29, 30 and 33-34 either directly or indirectly depend on amended claim 5. Applicant has addressed Kawakami above in section I(A) regarding amended claims 1 and 5.

Saidi discloses an electrochemical cell having a nonmetal negative electrode without using any solid metal active material. Saidi, however, does not teach, suggest or disclose

the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:



$\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$	(3)
$\text{Li}_x\text{Mn}_2\text{A}_4$	(4)
$\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$	(5)
$\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$	(6)
Li_xBA_2	(7)
$\text{Li}_x\text{BO}_{2-z}\text{A}_z$	(8)
$\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2$	(9)
$\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z$	(10)
$\text{Li}_x\text{NiCoA}_2$	(11)
$\text{Li}_x\text{NiCoO}_{2-z}\text{A}_2$	(12)
$\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2$	(13)

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Neither Saidi, Kawakami, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Saidi, Kawakami, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Saidi in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 16, 17, 20 and 21, and 29, 30 and 33-34, respectively, would also not be obvious over Miyasaka in view of Kawakami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 3-7, 16, 17, 20, 21, 29, 30, 33, 34 and 37 are respectfully requested.

C. It is asserted in the Office Action that claims 22 and 35 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Saidi, in view of Kawakami and further in view of U. S. Publication No. 2001/0010807 by Matsubara ("Matsubara"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's claim 22 is directly dependent on amended claim 1. Applicant's claim 35 is directly dependent on amended claim 5. Applicant's claim 22 directly

depends on claim 1. Applicant claim 35 directly depends on claim 35. Applicant has addressed Saidi and Kawakami regarding claims 1 and 5 above in section I(B).

Matsubara discloses a lithium/nickel/cobalt composite positive active material for a secondary battery. Matsubara, however, does not teach, suggest or disclose

the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:

- | | |
|---|------|
| Li_xMnA_2 | (1) |
| $\text{Li}_x\text{MnO}_{2-z}\text{A}_z$ | (2) |
| $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$ | (3) |
| $\text{Li}_x\text{Mn}_2\text{A}_4$ | (4) |
| $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$ | (5) |
| $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$ | (6) |
| Li_xBA_2 | (7) |
| $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ | (8) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2$ | (9) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z$ | (10) |
| $\text{Li}_x\text{NiCoA}_2$ | (11) |
| $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_2$ | (12) |
| $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2$ | (13) |

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Neither Saidi, Kawakami, Matsubara, nor the combination of the three, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Saidi, Kawakami, Matsubara, nor the combination of the three, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Saidi in view of Kawakami and Matsubara since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly depend from amended claims 1 and 5, namely claims 22, and 35, respectively, would also not be obvious over Miyasaka in view of Kawakami and Matsubara for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 22 and 35 are respectfully requested.

D. It is asserted in the Office Action that claims 1, 3-9, 16-19 and 29-32 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 6,589,694 issued to Gosho et al. ("Gosho") and further in view of Kawakami. Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant has addressed Kawakami above in section I(A) regarding claims 1 and 5.

Gosho discloses a positive electrode active material, a negative electrode active material and an electrolyte used in a non-aqueous secondary battery. Gosho, however, does not teach, suggest or disclose

the amount of the additive is 0.01 to 10 wt% of the positive active material, and the lithiated transition metal compound is selected from the group consisting of compounds represented by formulas 1 to 13:

- | | |
|---|------|
| Li_xMnA_2 | (1) |
| $\text{Li}_x\text{MnO}_{2-z}\text{A}_z$ | (2) |
| $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$ | (3) |
| $\text{Li}_x\text{Mn}_2\text{A}_4$ | (4) |
| $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$ | (5) |
| $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$ | (6) |
| Li_xBA_2 | (7) |
| $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ | (8) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{A}_2$ | (9) |
| $\text{Li}_x\text{B}_{1-y}\text{M}''_y\text{O}_{2-z}\text{A}_z$ | (10) |
| $\text{Li}_x\text{NiCoA}_2$ | (11) |
| $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_2$ | (12) |
| $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_2$ | (13) |

wherein $1.0 \leq x \leq 1.1$, $0.01 \leq y \leq 0.1$, $0.01 \leq z \leq 0.5$, M' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Co, Mg, La, Ce, Sr and V, M'' is at least one transition metal or lanthanide metal selected from the group consisting of Al, Cr, Mn, Fe, Mg, La, Ce, Sr and V, A is selected from O, F, S or P, and B is Ni or Co.

Neither Gosho, Kawakami, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 5, as listed above. Since neither Gosho, Kawakami, nor the combination of the two, teach, disclose

or suggest all the limitations of Applicant's amended claims 1 and 5, as listed above, Applicant's amended claims 1 and 5 are not obvious over Gosho in view of Kawakami since a *prima facie* case of obviousness has not been met under MPEP §2142.

Additionally, the claims that directly or indirectly depend from amended claims 1 and 5, namely claims 8, 16 and 19, and 9 and 29-32, respectively, would also not be obvious over Gosho in view of Kawakami for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1, 3-9, 16-19 and 29-32 are respectfully requested.

CONCLUSION

In view of the foregoing, it is submitted that claims 1, 5 and 8-35 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

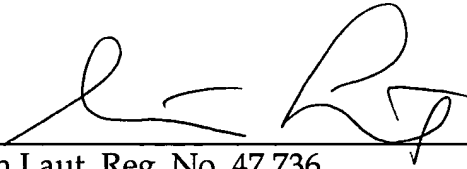
PETITION FOR EXTENSION OF TIME

Per 37 C.F.R. 1.136(a) and in connection with the Advisory Action mailed on October 14, 2005, Applicant respectfully petitions the Commissioner for a one (1) month extension of time, extending the period for response to October 31, 2005 (October 29, 2005 being a Saturday). Applicant submits payment in the amount of \$120.00 to cover the petition filing fee for a 37 C.F.R. 1.17(a)(1) large entity. A duplicate copy of the fee transmittal sheet is enclosed.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

Dated: October 31, 2005

By: 
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on October 31, 2005.


Jean Svoboda